

REMARKS

The foregoing amendment amends Figure 9-11 and 24 and claims 1 and 4. Pending in the application are claims 1-22, of which claims 1, 5 and 14 are independent and claims 5-22 have been withdrawn. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Claims 1 and 4 are amended for purposes of clarity only. Specifically, claim 1 is amended to specify that the oxidant gas inlet and the oxidant gas outlet are provided in a first side of the cathode side separator, and the fuel gas inlet and the fuel gas outlet are provided in a first side of the anode side separator opposite the first side of the cathode side separator.

Claim 4 is amended to change the phrase "said sealing member" to --a sealing member--. *No new matter is added.*

Amendment of the claims is not to be construed as an acquiescence to any of the objections/rejections set forth in the instant Office Action, and was done solely to expedite prosecution of the application. Applicants reserve the right to pursue the claims as originally filed, or similar claims, in this or one or more subsequent patent applications.

Objections to the Drawings

Applicants have amended Figure 9-11 and 24 to include a ---Prior Art--- designation, as suggested by the Examiner, and request that the objection to the drawings be reconsidered and withdrawn.

35 U.S.C. 112 Rejections

Regarding the rejection of claims 1-4 under 35 U.S.C. 112 for being indefinite, Applicants have amended claims 1, 2, 3 and 4 to address the issues raised by the Examiner and request that the rejection of the claims under 35 U.S.C. 112 be reconsidered and withdrawn.

Regarding claims 1-3, Applicants remove reference to "the other side" to correct the lack of antecedent basis. Specifically, Applicants have amended the last three lines of claim

1 to clarify that the cited “side of the anode side separator” is opposite to the side of the cathode side separator on which the oxidant gas inlet and the oxidant gas outlet are provided.

Claim 4 is amended to change the phrase “said sealing member” to --a sealing member-- to correct the lack of antecedent basis for “said sealing member”.

35 U.S.C. 102 Rejections

Regarding the rejection of claims 1-4 under 35 U.S.C. 102(e) as being anticipated by the Saitou reference (U.S. Patent Number 6,599,651) and the rejection of claims 1, 2 and 4 under 35 U.S.C. 102(e) as being anticipated by the Fujii reference (U.S. Patent Number 6,528,196) or the Yosida reference (U.S. Patent Number 6,566,001), Applicants traverse the rejection and submit that the pending claims distinguish patentably over the cited references.

The present invention is directed to a fuel cell including a U-shaped oxidant gas channel provided on a cathode side separator and a U-shaped fuel gas channel provided on an anode side separator. The inlet of the oxidant gas channel is provided the same side of the cathode side separator as the outlet of the oxidant gas channel. The inlet of the fuel gas channel is provided on the same side of the anode side separator as the outlet of the fuel gas channel. The oxidant gas channel and the fuel gas channel are oriented in opposite directions when the fuel cell is assembled. For example, when the fuel cell is assembled, the inlet and outlet of the oxidant gas channel are located on a side of the cathode side separator, such as the left side, that is *opposite* the side of the anode side separator where the inlet and outlet of the fuel gas channel are located, such as the right side.

The configuration of the gas channels in the fuel cell of the present invention allows for simplification of humidification system by humidifying a reaction gas at a reaction gas inlet. The configuration further efficiently exhausts condensed water from a gas channel to increase the efficiency of fuel cell while reducing the overall size of fuel cell.

The cited references do not teach or suggest a fuel cell including U-shaped gas channels where the inlet and the outlet of each gas channel are provided on the same side of an associated separator, as recited in claim 1. The cited references also fail to teach or suggest a fuel cell having an oxidant gas inlet and outlet provided at a first side of a cathode

side separator and a fuel gas inlet and outlet provided at a first side of an anode side separator that is opposite to the first side of the cathode side separator, as recited in claim 1. Rather, all three cited references disclose *serpentine* gas channels, each having an inlet and an outlet formed on *opposite* sides of a separator.

For example, the Saitou reference discloses a separator provided with an air introduction port 42 and a fuel gas introduction port 43 provided in one corner of the separator, i.e., the *same* side of the separator. The Saitou reference specifies that the air discharging port 44 and the fuel gas discharging port 45 are provided “at the side *opposing* the induction ports” (emphasis added) in column 9, lines 54-56. Therefore, the Saitou reference fails to teach or suggest a gas channel having an inlet and an outlet formed on the *same* side of a separator, as recited in claim 1. The Saitou reference also fails to teach or suggest an oxidant gas channel having an inlet and an outlet located on an opposite side from an inlet and an outlet of a fuel gas channel.

The Fujii reference also describes fuel cell separators having gas channels where the inlet and the outlet of the gas channel are formed on *opposite* sides. For example, as shown in Figure 3, an oxygen-containing gas inlet 36A is formed on a first side of a cathode separator, while the oxygen-containing gas outlet 36B is provided “diagonal position with respect to the oxygen-containing inlet 36A” i.e., an opposite side of the separator (see column 3, lines 36-42). The Fujii reference also fails to teach or suggest an oxidant gas channel having an inlet and an outlet located on an opposite side from an inlet and an outlet of a fuel gas channel.

The Yosida reference also describes a fuel cell separator having serpentine-shaped oxygen-containing gas flow passages in communication an oxygen-containing gas inlet 38A and provided at a “diagonal position with respect to....the oxygen-containing gas outlet 38b” (see column 3, lines 57-60). Because the Yosida reference describes a gas channel having an inlet and an outlet formed on *opposite* sides of a separator, the Yosida reference also fails to anticipate the claimed invention. Moreover, the Yosida reference also fails to teach or suggest an oxidant gas channel having an inlet and an outlet located on an opposite side from an inlet and an outlet of a fuel gas channel.

Because claim 1 distinguishes patentably over the cited references, claims 2 to 4, dependent from claim 1, are also patentably distinguishable over the prior art.


CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue. If, however, the Examiner considers that obstacles to allowance of these claims persist, we invite a telephone call to Applicant's representative.

Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 12-0080, under Order No. SIW-020 from which the undersigned is authorized to draw.

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Respectfully submitted,

By 
Anthony A. Laurentano
Registration No.: 38,220
LAHIVE & COCKFIELD, LLP
28 State Street
Boston, Massachusetts 02109
(617) 227-7400
(617) 742-4214 (Fax)
Attorney for Applicants